

Alternative 7 – Baker Avenue Route

This Alternative would direct trail users through the MBTA parking lot to the rail line where it would turn and head easterly along the Assabet River running parallel to the rail line on the north side of the tracks. A new pedestrian bridge would be proposed over the Assabet River and the trail would continue easterly to Baker Avenue. At Baker Avenue, the trail would turn right crossing over the MBTA commuter rail line proceeding toward Main Street. Once the trail reaches Main Street, there are two options. Please note this alternative is being evaluated without mapping and survey elevations. Once that information becomes available further investigation into this alternative will be necessary to draw concrete conclusions.

In order to accommodate the trail in the existing MBTA parking lot, parking spaces would be lost. As stated previously, the MBTA did indicate at a meeting held on July 13th, 2009 that they would not allow for the loss of any parking or allow bikes to ride through the parking lot. Therefore this alternative is being evaluated assuming that no parking spaces can be lost and the trail cannot go through the MBTA parking lot. It should also be noted as stated in previous alternative that Concord Zoning Bylaw requires full size parking spaces to be 9'x18' with a 24' aisle width to accommodate two-way traffic. The existing parking lot is approximately fifty (50) to fifty-one (51) feet in width at the northern limits and allows for two rows of 90° parking. With a required width of 60 feet the existing parking lot does not meet the Zoning Bylaws and does not provide sufficient space to accommodate a trail.



As stated previously, there is an eight (8) to nine (9) foot gap between the edge of the MBTA lot and the Concord Park parking lot. They are separated by a fence. Concord Park has four “utility boxes” in this area enclosed by stockade fencing. The fencing is approximately eight (8) feet away from the edge of the commuter parking lot. The **Guide** and AASHTO require a ten (10) foot trail with two (2) foot graded shoulders and a three (3) foot clearance to any obstruction. Ideally, the trail section through this area should be twenty (20) feet in width. MassDOT may permit some exceptions to this design with explanation and communication.

Since the gap between the parking lots is also not sufficient for the trail, one or both of the parking lots will require adjustment. Since the MBTA will not allow for the loss of parking spaces, Concord Park may lose parking spaces. If this area were utilized for a portion of the trail, it is likely that the removal and resetting of the “utility boxes” would be required. This alternative may also result in increasing impervious area on the VOA Concord Assisted Living, Inc. property. It would be GPI’s recommendation to propose fencing or an alternate barrier to separate the trail from the MBTA parking lot to prevent trail users from utilizing the existing rail

FINAL REPORT

Proposed Bruce Freeman Rail Trail/MBTA Commuter Rail Crossing Alternative Analysis

crossing in the parking lot at Union Station and possibly to separate the trail from Concord Park to keep trail users off the property.

Once the trail approaches the tracks, it would take a 90° turn prior to and just north of reaching the tracks. A 90° turn would be required to minimize impacts to abutting property and would require signing instructing trail users to dismount their bikes and walk them. This would not meet the minimum radius requirements in the *Guide*. As stated previously, the MBTA parking between the tracks and Concord Park is approximately thirty-nine (39) feet in width. It is partially owned by the MBTA and partially owned by the EOTC. The area allows for one row of 90° parking. Concord Zoning Bylaw requires forty-two (42) feet to accommodate this parking. The existing parking area does not meet the Zoning Bylaws and a trail could not be incorporated in this area without taking parking. Although the State is exempt from local zoning bylaws, it would be GPI's recommendation to place the trail north of the parking area on the Concord Park property.



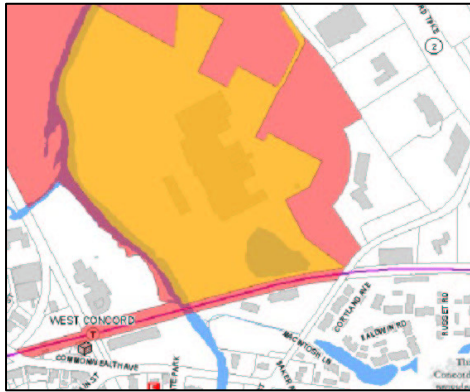
As stated earlier, at the narrowest point, there is just over 34 feet between the Concord Park facility and the commuter rail parking lot. There are also several plantings, some fencing and a rear access drive to Concord Park. This would require additional right-of-way from VOA Concord Assisted Living, Inc. The proposed trail would cross the rear access drive to Concord Park. It would be GPI's recommendation to place fencing between the Concord Park facility and the proposed trail to keep trail users off the property.

The trail would continue easterly and require a bridge to cross the Assabet River which is designated a Wild and Scenic River. A prefabricated structure could be utilized. It is likely that the abutments would be located in the 100 year floodplain and could potentially impact the existing wetlands. Borings would be required to determine the subsurface material in this area in order to design the substructure.



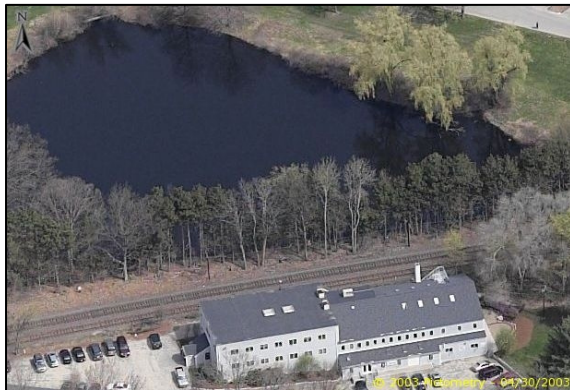
As mentioned previously, the Assabet River was designated a Wild and Scenic River in 1999 with ecology, archaeology and history, scenic, recreation and literary resources being identified as the “outstandingly remarkable values”. The Wild and Scenic Rivers Act prohibits any department or agency of the United States from assisting in the construction of any water resources project that would have a “direct and adverse” effect on the values for which the river was established and it precludes federal assistance to projects below/above a designated river that have been determined to “invade the area or unreasonably diminish the scenic, recreational, and

fish and wildlife values present...as of the date of designation”. The River Stewardship Council (RSC) was established to coordinate conservation of the river. They function as an advisory committee to the National Park Service (NPS) on federal permits affecting the rivers’ outstanding resources. Any work would need to be reviewed by the RSC. Since they are not a permitting agency, they review projects through the Army Corps of Engineers PGP II application to determine if any project within a quarter mile of the designated river has a direct and adverse impact. They review plans and offer comments.



The MBTA right-of-way between the Assabet River and Baker Avenue appears to be approximately 65 feet in width. The trail would need to be outside and north of the MBTA right-of-way with fencing separating the trail from the rail line since the MBTA has previously voiced concerns with the possibility of the high speed trains throwing ice or debris as they pass. The fencing would also prevent trail users from approaching the tracks. This property is the 300 Baker Avenue property and is owned by Normandy Concord Acquisition LLC.

There is a body of water on this property just outside the MBTA right-of-way. In order to route the trail through the 300 Baker Avenue property, some form of a boardwalk would be necessary. The boardwalk would need to be approximately 400 feet in length. It would require permitting through the Concord Natural Resources Commission.



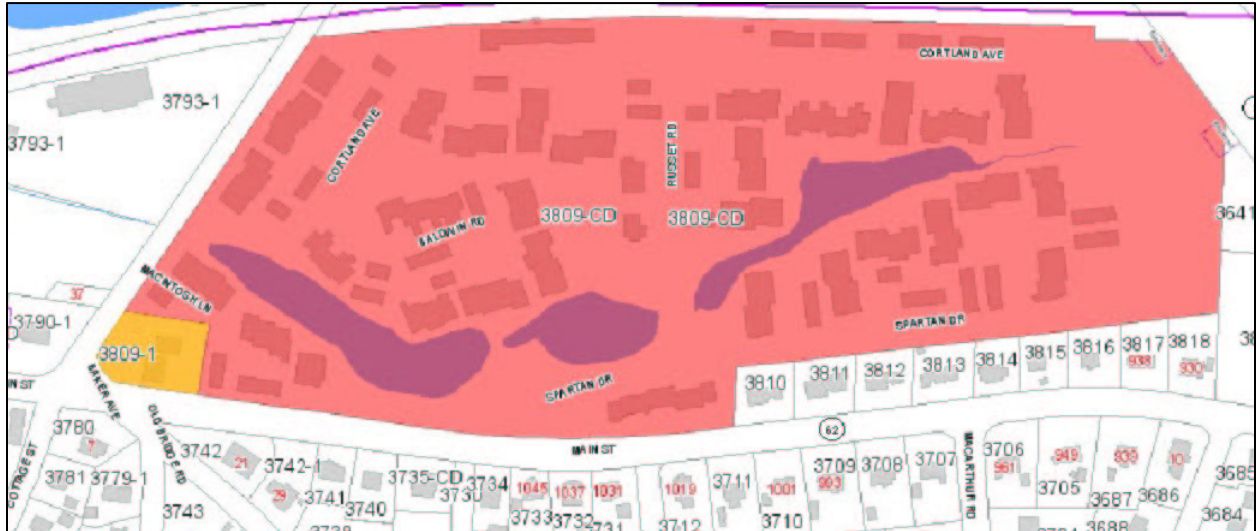
Utility poles are located along the railroad right-of-way along the northern side of the tracks. These would likely need to be relocated in order to accommodate the trail. Once the trail reached Baker Avenue, it would turn right onto Baker Avenue and cross the tracks at the existing gates. The radius of this turn would not meet the minimum radius requirements in the *Guide*.



FINAL REPORT

Proposed Bruce Freeman Rail Trail/MBTA Commuter Rail Crossing Alternative Analysis

The Baker Avenue right-of-way appears to be forty (40) feet while the pavement width varies between twenty-five (25) and thirty (30) feet. Thirty feet of available pavement would allow two eleven (11) foot travel lanes with two four (4) foot “sharrow” lanes. Where thirty feet of pavement was not available, right-of-way would be required. The utility poles are located along the eastern side of Baker Avenue although there is one utility pole just south of the tracks on the western side of Baker Avenue. The buildings are also much closer to the roadway along the eastern side of the roadway. All of the property along the eastern side of Baker Avenue between the tracks and Main Street is owned by 112 Main Street LLC.



To avoid relocation of the utility poles and potential property impacts, right-of-way would potentially be necessary from the property owners along the western side of Baker Avenue. These owners include John W. Boynton and A. E. Winemiller (Baker Avenue Appreciation LLC) of 336 Baker Avenue, Irene R. Smith of 36A Baker Avenue and Nikoel LLC of 1134 Main Street. There are however several large trees and a sidewalk along the western side of Baker Avenue. The sidewalk runs from the tracks to Main Street.

There is a small waterway which is carried under Baker Avenue through a large culvert outletting on the western side of the roadway. There is also a small culvert emptying through the wingwall. There is guard rail at the edge of the sidewalk. Depending on available pavement width in this area, the culverts may need to be extended and the guard rail may need to be removed and reset. Mass GIS mapping indicates that this waterway has 100 year floodplain associated with it and there are likely wetlands.





northwest corner of the intersection at the back of the sidewalk.

The trail would cross two commercial driveways along the western side of Baker Avenue. The second is the drive to Citizen's Bank which is at the intersection of Baker Avenue and Main Street. The pavement width does increase as Baker Avenue approaches Main Street since there are four travel lanes. There is a median island with an electric utility pole separating the northbound and southbound travel lanes. There is an existing traffic signal at this intersection with a signal pole at the

Alternative 7A – Main Street to the Rail Right-of-Way

This alternative proposes the trail turn right onto Main Street. See Figures 12 and 13 on the following pages. The radius of this turn would not meet the minimum radius requirements in the **Guide**. The right-of-way on Main Street appears to be between forty-five (45) and fifty (50) feet while the existing pavement width appears to be between twenty five (25) and thirty (30) feet. There is a sidewalk along both sides of Main Street. If thirty-feet of pavement width were available, two eleven (11) foot travel lanes could be provided with four (4) foot “sharrow” lanes. It should be noted that with the heavy volume of traffic on Main Street, five (5) foot dedicated bike lanes would be preferred.



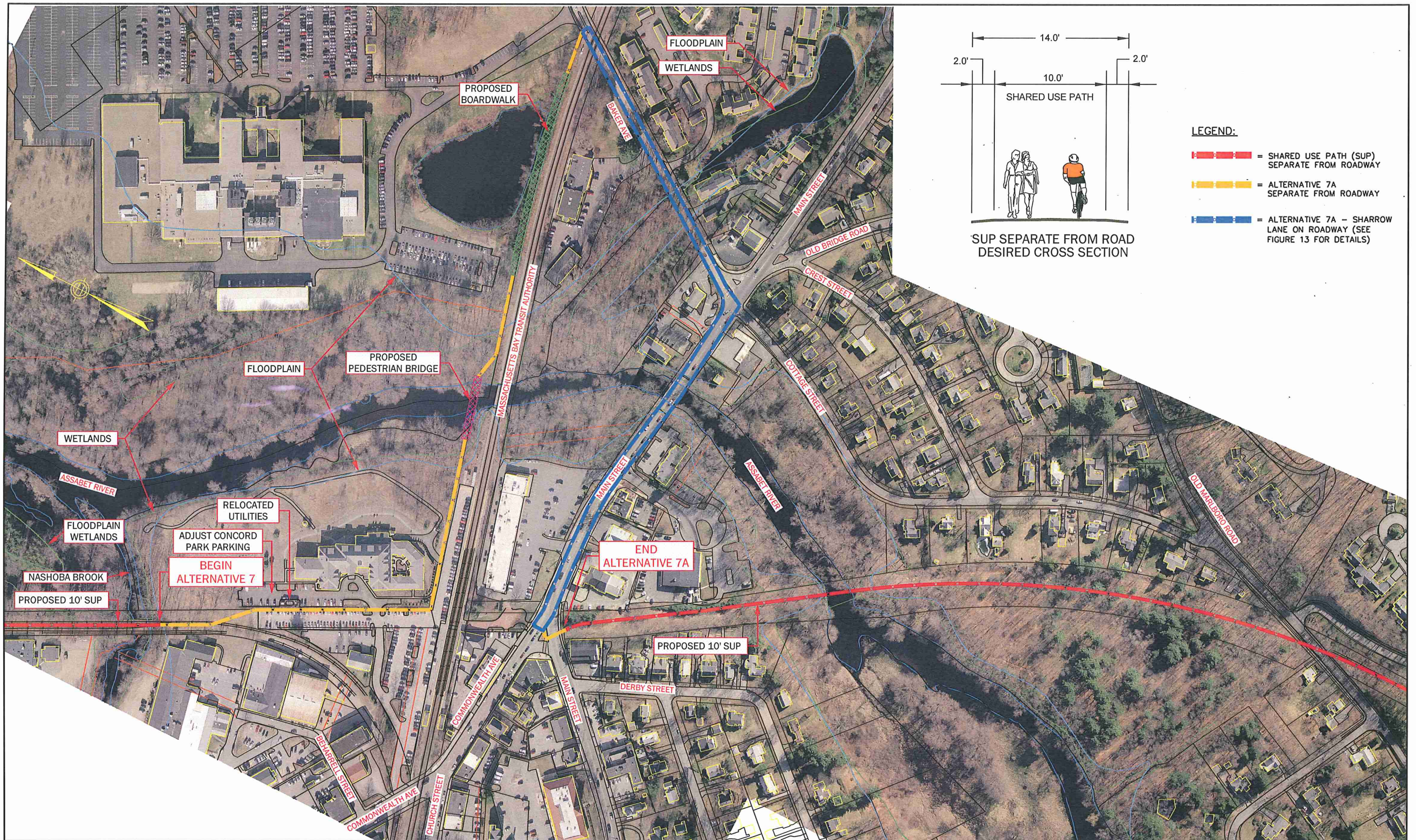
If thirty feet of pavement were not available, this alternative would likely not be an option since Main Street crosses over the Assabet River via a bridge. If it were not available, the bridge would need replacement to achieve the necessary width. The cost of the bridge replacement would likely remove this alternative from consideration unless the town opted to pay for the replacement.

The trail would continue along Main Street to the existing rail right-of-way. It does appear that thirty feet of pavement may be available along the remainder of Main Street allowing for two eleven (11) foot travel lanes and two (4) foot “sharrow” lanes, however as mentioned with the heavy volume of traffic five (5) foot dedicated bike lanes would be preferred. If the width was not available, right-of-way would be required from the several abutting commercial property owners. Main Street can be very busy at times and is abutted on both sides by commercial properties. This could potentially create a dangerous situation for trail users and would likely discourage parents with small children from utilizing the trail.

Alternative 7B – Cottage Street to Old Marlboro Road

This alternative proposes that the trail cross Main Street from Baker Avenue to Cottage Street. See Figures 13 and 14 on page 65 and 66. Cottage Street appears to have a right-of-way width of approximately forty (40) feet and a pavement width of approximately twenty-four (24) feet. Cottage Street is a residential street with many large trees, mailboxes, fencing and utilities including fire hydrants and poles. There is one commercial property at the southwest corner of the intersection of Cottage Street with Main Street. It does not appear that the existing pavement width will accommodate bike travel and right-of-way would be necessary.

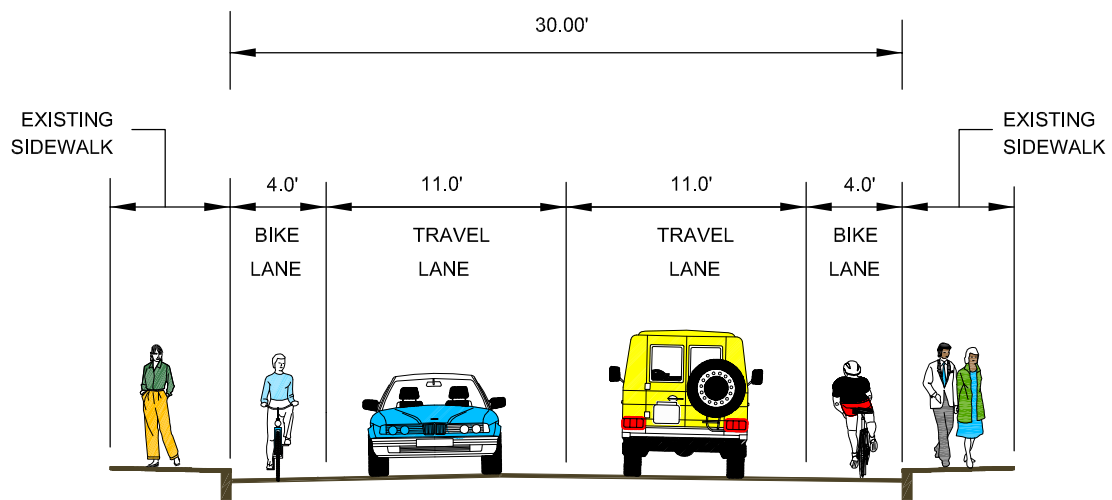




ALTERNATIVE 7A - CONCEPTUAL PLAN
 BAKER AVENUE TO MAIN STREET
 CONCORD, MA

FIGURE 12

SCALE: 1" = 120'



BAKER AVENUE
 MAIN STREET
 COTTAGE STREET
 OLD MARLBORO ROAD

ALTERNATIVE 7
 SHARROW LANE ON ROADWAY
 CONCORD, MA

FIGURE 13

NOT TO SCALE



**ALTERNATIVE 7B - CONCEPTUAL PLAN
BAKER AVENUE TO COTTAGE STREET
CONCORD, MA**

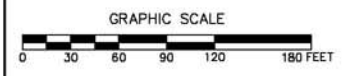


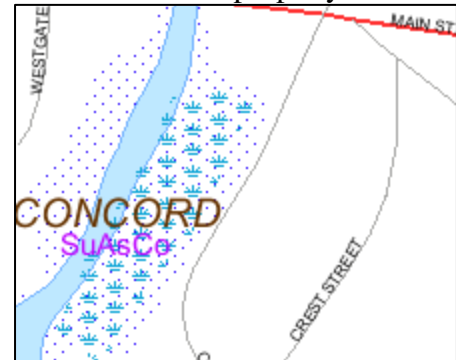
FIGURE 14

SCALE: 1" = 120'



The eastern side of Cottage Street has several abutting residential properties. There are six homes on Cottage Street between Main Street and the first curve heading southward along the roadway. Although there are no homes or buildings along the western side of Cottage Street until the first curve in the roadway, there is a large area of wetlands and 100 year floodplain associated with the Assabet River. The utility poles are located along the western side of Cottage Street. This presents two options, one would be to take property from the six residential property owners

including William B. and Natalie C. McCarthy, Concord Housing Authority, Ellen B. Garber, Stephen T. Irza and Anne E. Leggat, George and Carolyn Gould and Stephen and Claudette Cavalier in order to widen the roadway and avoid relocating the utility poles and an extensive environmental permitting process. The second would be to take property from two property owners including George F. and Shirley R. Rohan and George R. and Cuma V. Dee along the western side of Cottage Street, relocate the utility poles and either fill the wetlands and floodplain or construct a boardwalk over this area. The boardwalk would minimize resource area impacts but still require permitting. Both options are costly, time consuming and may create a road block for the project depending on the square footage of wetlands being filled.



After the curve in Cottage Street, there are residential properties on both sides of the roadway south to Old Marlboro Road. The pavement width also seems too narrow. Right-of-way would be necessary from numerous residential property owners to widen the roadway to accommodate bicycle travel. It appears that there are eight residential properties along the western side of Cottage Street including Thomas F. And Pamela J. Gardner, Wagner Realty Trust, Richard A. and Jane H. Montague, Michael A. and Caroline R. Partridge, Christine Parks, Lorne Cooper and Nancy Birchard, Peter M. and Anne O. Standish and Eric Holm and Donna L. Deangelis. The property along the eastern side is owned by Lelie R. Senderlund, Thomas R. and Carey B. Sands, Rose Mary Gordon, Imants K. and Aina S. Skaubitis, Scott M. and Colleen N. Van Houten, Yvonne E. and Mary P. Theriault and Olof C. and Jane A. Johnson. Without survey information it is impossible to determine how much property would be needed and the best location to take this property to minimize impacts.

In addition, the elevation of the Cottage Street roadway increases considerably as it continues south. Review of available mapping indicates that the elevation increases over thirty feet between Main Street and Old Marlboro Road. In the vicinity of the curve in the road depicted in the adjacent photo, the roadway climbs over 21 feet in approximately 350 feet. This slope would present issues with ADA compliance since it is in excess of 5%.





The trail would then turn right onto Old Marlboro Road until it meets the existing rail right-of-way. The right-of-way along Old Marlboro Road appears to be approximately forty (40) feet wide while the pavement width only appears to be approximately twenty-four (24) feet. This would not be sufficient to accommodate bicycle travel so right-of-way would be necessary. There are three properties on the southern side of Old Marlboro Road owned by Raouf A. and Sarah T. Ismail, Jeffrey M. and Susan J. Patterson and 1112 Main Street LLC before the railroad right-of-way is reached.

If Alternative 7B were selected, the Town would need to decide whether the portion of right-of-way between the town center and Old Marlboro Road would be designed and paved. Paving this portion of the right-of-way would provide a spur to the businesses in West Concord and the MBTA Commuter Rail. It will also however encourage trail users to avoid the long circuitous route of this Alternative and cut through West Concord. Not including this portion of the right-of-way would eliminate a bridge over the Assabet River.



Another option to consider is to make Cottage Street one-way from Old Marlboro Road to Main Street. If this were done, there appears to be sufficient pavement width to accommodate dedicated bike lanes along Cottage Street. This option still does present issues with grades and ADA compliance.

EVALUATION CRITERIA

Effectiveness

Since human nature is to find the most direct route from Point A to Point B, users may try and find a more direct route since it is a fairly long and circuitous route. Sharing the road with motor vehicles may discourage families with young children from utilizing the trail.

Short-term and Long-term Reliability

Although not direct, this Alternative does provide a continuous path for the BFRT.

Short-term and Long-term Maintenance Costs

The maintenance costs discussed earlier in this report also apply to this alternative. The annual maintenance cost for a trail is approximately \$1,500/mile. The long-term paving cost would be approximately \$80,000/mile the first time and \$130,000/mile the second time.

In addition, it should be emphasized that structures must be inspected on a recurring basis. Although this inspection should occur yearly, studies have shown the average inspection interval is four years. Bridges could be constructed with galvanized steel to eliminate the need for periodic painting. However, bridge structures would require periodic maintenance to repair galvanized coating failures, leaking joints, and miscellaneous repairs to chipped walking surfaces or damaged protective screens. Additionally, any lighting or security cameras within the bridge/ramps would require periodic replacement. Boardwalk structures are typically constructed

of timber and would require miscellaneous repairs on regular intervals for member replacements and repairs.

Difficulty in Implementing

According to Concord GIS, in addition to the riverfront resource area, the Assabet River has floodplain and wetlands. The extent of the floodplain of the Assabet River varies along its length. Floodplain and wetlands are also associated with the wetland area along Cottage Street. Any area within the floodplain would be subject to periodic flooding. Compensatory flood storage must be provided for any floodplain filled. If wetlands are filled, replication must be provided. If more than 5,000 square feet of wetlands is filled, more extensive permitting will be required including a Category II Army Corps of Engineers Programmatic General Permit.

Borings would need to be conducted to determine the subsurface soil information, the location of the water table and the presence of ledge prior to initiating the design of this alternative for the pedestrian bridge and boardwalk(s).

Substantial right-of-way would be required from both residential and commercial properties in order to meet the guidelines.

Trail users would be sharing the road with motor vehicles with both options 7A and 7B.

It should be noted that this option has not been presented to the MBTA or MassDOT. Since both Alternatives 7A and 7B could potentially require right-of-way from the MBTA or potential adjustments to their parking facilities, it is likely that they will require further review of this alternative.

These alternatives may require Design Exceptions since they may not meet the design standards. This cannot be determined until survey has been completed. If required, this would entail the preparation of a Design Exception Report and approval by the Design Exceptions Committee. They would require discussion and/or meetings with both the AAB/ADA Coordinator and the Bicycle/Pedestrian Accommodation Engineer at Mass DOT. At this time, it is unknown whether or not either of these options would be approved by MassDOT. In discussions with MassDOT regarding this report, they had indicated that they would need a formal submission in order to evaluate any alternative and make any decisions.

With federal funds being allocated towards the construction of the BFRT, a Categorical Exclusion (CE) Checklist would be required. Since work will be proposed within the Riverfront Area of Nashoba Brook and the Assabet River, a Notice of Intent must be filed with the Concord Natural Resources Commission. It is also possible that an Environmental Notification Form (ENF) would be required assuming that this would be constructed as part of the Concord BFRT and not independently. With the proposed bridge crossing over the Assabet River, a Chapter 91 Waterways License will be required. It should be noted that some of these permits will be required regardless of this alternative; however, work in the floodplain makes the permitting process much more extensive. An Army Corps of Engineers PGP II Application and coordination with the RSC would be required due to the Wild and Scenic River designation of the Assabet River.

Any work within the floodplain would require contacting the Federal Emergency Management Agency (FEMA). Projects proposed in floodplains are reviewed in conjunction with Massachusetts Environmental Policy Act (MEPA), Massachusetts Wetlands Protection Act, and Massachusetts Office of Coastal Zone Management reviews.

Cost to Design and Implement

The design cost for Alternative 7A would be between \$750,000.00 and \$1 million. The design cost for Alternative 7B would be approximately \$1 million to \$1.5 million.

The construction cost for Alternative 7A would be between \$6 and \$8 million. If additional architectural features were included to improve the structure aesthetics, the total cost could increase by 25% or more depending on the architectural features.

The construction cost for Alternative 7B would be between \$7 and \$9 million. If additional architectural features were included to improve the structure aesthetics, the total cost could increase by 25% or more depending on the architectural features.

In addition to design and construction costs, construction in a floodplain may make it necessary to get flood insurance in order to obtain construction financing.

Risk to Public Safety

Rail-Trail Maintenance & Operation published by the Rails to Trails Conservancy Northeast Regional Office states that approximately a quarter of constructed trails of the 100 trails surveyed reported illegal activities unique to bridges and tunnels including climbing and jumping from bridges, graffiti and vandalism. Trail users will be put in potential contact with motor vehicles at the access drive to Concord Park (Alternatives 7A and 7B), along Baker Avenue (Alternatives 7A and 7B), Main Street (Alternative 7A), Cottage Street (Alternative 7B) and Old Marlboro Road (Alternative 7B).

Vehicular Impacts

This alternative results in potential impacts to the MBTA Commuter Rail parking lot and the Concord Park parking lot. Although no parking spaces can be lost in the MBTA Commuter Rail parking lot and it will be the goal to avoid losing parking spaces from Concord Park, there would be potential impacts during construction. Vehicles will also be sharing the road with bicycles and pedestrians along Baker Avenue (Alternatives 7A and 7B), Main Street (Alternative 7A), Cottage Street (Alternative 7B) and Old Marlboro Road (Alternative 7B). .

Benefits to the Community

Routing the trail over the Assabet River would provide a very scenic route for the BFRT. Both alternatives 7A and 7B do provide a continuous route for the trail. Both alternatives will provide the residential neighborhoods along Baker Avenue and Cottage Street easy access to the trail.

Timeliness to Implement

Design of a bridge requires extensive MassDOT review. Substantial right-of-way would be required with both Alternatives 7A and 7B. Depending on the extent of work in the floodplain and wetlands, the permitting process could be extensive.

Assuming the design and construction is completed as part of the BFRT Phase 2C and the abutters are amenable, the design could be completed within 24 to 30 months. The construction would take approximately 30 to 36 months.

Context Sensitive Aesthetics

Architectural features could be added to the pedestrian bridge and boardwalk structure. Pavers and plantings could be included.

Fencing could negatively impact the visual character and aesthetics of the area.